

UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA  
and the STATE OF WISCONSIN

Plaintiffs,

v.

P. H. GLATFELTER COMPANY  
and  
WTM I COMPANY  
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

CIVIL ACTION NO. 03-C-0949

The Honorable Lynn Adelman

**VOLUME 4 OF 6**

**APPENDIX OF PUBLIC COMMENTS ON  
“CONSENT DECREE FOR REMEDIAL DESIGN AND REMEDIAL ACTION AT  
OPERABLE UNIT 1 OF THE LOWER FOX RIVER AND GREEN BAY SITE”**

Respectfully submitted,

For the United States of America

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***Permitting Review for  
Sediment Melter Facility***

***May 30, 2003***

***Prepared for:***

***Wisconsin Department of  
Natural Resources***



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## 1.0 BACKGROUND AND INTRODUCTION

A 39-mile stretch of the Fox River and portions of Green Bay in northeastern Wisconsin (the Fox River site) are contaminated with polychlorinated biphenyl (PCB) laden sediment. The contamination was caused by historical effluent discharges from paper mills manufacturing and/or recycling carbonless paper that utilized dyes dissolved in PCBs. PCBs are the primary contaminant of concern; however other contaminants of concern (COCs) identified in the baseline risk assessment include dioxins/furans, DDT, Dieldrin, arsenic, lead, and mercury. A Remedial Investigation/Feasibility Study (RI/FS) has been performed under the direction of the Wisconsin Department of Natural Resources (DNR) and a draft report was issued in 1999. The study concluded that a total of approximately 7.25 million cubic yards of sediment requires removal in order to meet a clean up goal of 1 ppm PCBs. A proposed Remedial Action Plan for the lower Fox River and Green Bay was published in October 2001.

DNR contracted with Minergy Corporation (Minergy) to investigate thermal treatment technology alternatives for Fox River site sediment remediation. Based on an initial study of sediment physical and chemical properties, Minergy recommended vitrification of the sediment in an oxyfuel fired glass furnace (Glass Furnace Technology or GFT). In cooperation with DNR and EPA's Superfund Innovative Technology Evaluation (SITE) group, Minergy has completed bench-scale and pilot-scale testing of the GFT process and the results are favorable. In general, completed studies have demonstrated that the PCB contaminated river sediment can be successfully converted into a vitrified glass aggregate product meeting ASTM specifications for blended cements. The process and environmental performance data generated during the pilot-scale test also indicate that a commercial-scale GFT application is feasible.

Minergy was contracted by DNR to perform a review of relevant state and federal permitting requirements for a full scale sediment melter facility. The results of that study are presented in this report.

## 1.1 History of Fox River site Investigation and Remediation Efforts

Numerous studies have been performed on the Fox River site, including mass balance studies to quantify the nature and extent of contamination and remedial feasibility and technology studies. The first RI/FS was initiated by a private-public partnership known as the Fox River Coalition. This study resulted in an expanded database of contamination magnitude and extent and eventually, under funding by the Wisconsin Department of Natural Resources (DNR) and EPA, led to the first remediation pilot project (the Deposit N pilot demonstration project).

In 1994 the U.S. Fish and Wildlife Service (F&WS) and other co-trustees initiated a Natural Resource Damage Assessment (NRDA). Seven paper companies were identified as potentially responsible parties (PRPs) and became known as the Fox River Group (FRG). Following unsuccessful attempts to negotiate the RI/FS work with the FRG, the Fox River Intergovernmental Partnership was formed in 1997, comprising primarily the EPA, the National Oceanic and Atmospheric Administration (NOAA), the F&WS, DNR, and the Menominee and Oneida Indian Tribes of Wisconsin. The partnership goal was to share federal, state, and tribal resources to develop a comprehensive cleanup and restoration plan for the lower Fox River and Green Bay.

On July 28, 1998 the EPA formally proposed inclusion of the lower Fox River and Green Bay site on the National Priorities List (NPL). The NPL is a listing of the nation's hazardous waste sites eligible for cleanup under the federal Superfund program. The state of Wisconsin was opposed to this listing, and EPA agreed to delegate lead trustee responsibility for the RI/FS and site cleanup to DNR.

Although the Fox River site cleanup will be conducted by the State of Wisconsin, DNR will follow the CERCLA Superfund process. In February 1999, DNR released a draft RI/FS for public review and comment, and in November of 1999 DNR and EPA completed work on the Deposit N pilot demonstration project. The demonstration project showed that dredging of the PCB-contaminated sediment could be performed in an environmentally safe manner in

compliance with regulatory and permitting requirements and with support from the public and neighboring industries. Based on the RI/FS, DNR and EPA have developed a Proposed Remedial Action Plan (Proposed Plan) for cleanup of the lower Fox River and Green Bay.

The Proposed Plan describes various cleanup options considered and identifies the option that DNR and EPA believes to be the most appropriate for each reach of the five operable units (OU) identified. For three of the OU, the Proposed Plan recommends removal of approximately 7.25 million cubic yards (cy) of contaminated sediment containing over 29,200 kilograms (64,200 pounds) of PCBs using dredging techniques that minimize adverse environmental impacts. The Proposed Plan recommends that dredged sediments be disposed in one or more off-site licensed solid waste disposal facilities. DNR and EPA are also considering thermal treatment of dredged sediment using the Minergy GFT process. The Proposed Plan recommends monitored natural recovery of the residual PCB contamination for the other two OU.

The public comment period on the Proposed Plan ended on January 21, 2002. A final RI/FS and initial record of decision (ROD) for the Fox River site are in progress and expected to be published in late 2002.

## **1.2 Minergy GFT Feasibility Studies**

The GFT, designed by Minergy, has been successfully demonstrated on a pilot scale to convert contaminated Fox River site sediment to glass products with a wide variety of applications while encapsulating metal contaminants and destroying PCBs and other toxic organics. To date, three phases of GFT study have been substantially completed. Phase I involved a characterization of the mineral composition of the river sediments to determine whether a commercially viable glass aggregate product could be produced with the GFT. The conclusions from this initial phase indicated that the river sediment composition was favorable for glass manufacturing, and that the physical and chemical characteristics of the sediments were geographically consistent. Phase II involved crucible melts of actual Fox River site sediment and the preliminary engineering design for a pilot scale melter. The Phase I and II study results indicated GFT technology could be both feasible and economically viable for treating Fox River site sediments. Finally, Phase III



involved the construction and operation of a pilot scale GFT to generate operational data and determine the cost and treatment effectiveness of the technology for a potential full-scale implementation.

The Phase III pilot scale GFT demonstration was conducted from May to August 2001 at Minergy's GlassPack Test Center in Winneconne, Wisconsin under the EPA SITE program. The primary objectives of the demonstration were to determine the treatment efficiency of PCBs in dredged and dewatered river sediment when processed in the GFT, and to determine whether the GFT glass aggregate product meets the criteria for beneficial reuse under relevant federal and state regulations. Three secondary objectives included: 1) determine the unit cost of operating the GFT on dewatered dredged river sediment; 2) quantify the organic and inorganic contaminant losses resulting from the existing or alternative drying process used for the dredged and dewatered river sediment; and 3) characterize organic and inorganic constituents in all GFT process input and output streams.

Minergy published the final sediment melter demonstration report on December 1, 2001. EPA has not yet published a final SITE program report for the GFT demonstration project; however, data validation was completed on January 5, 2002 and EPA has released the study data.

### **1.3 GFT Permitting Feasibility**

Minergy performed a preliminary air quality permitting feasibility study in January 2002. This study, based on the pilot scale melter demonstration project results, concluded that a full scale GFT would be fully permittable under applicable federal and Wisconsin air regulations. However, due to the complexity and breadth of regulatory applicability to the proposed GFT remediation technology, DNR requested that Minergy perform a more detailed and comprehensive permitting feasibility study for a full scale GFT implementation.

The objective of this permitting feasibility study was to define multi-media environmental permits, licenses, and approvals (including regulatory requirements) that would be needed for a

proposed full scale (250 glass ton/day) GFT facility located on or near the Fox River site remediation project dredged sediment dewatering site(s).

This study was focused on major state and federal environmental regulations that are implemented through permits, licenses, or approvals. The study did not provide the comprehensive review of non-permit related environmental requirements (for example: SARA and CERCLA reporting, SPCC plan, SDWA, etc.).

## 2.0 SUMMARY OF FINDINGS AND CONCLUSIONS

Multi-media regulatory analyses, precedent research, and agency communications were performed to define the environmental permitting requirements and mechanisms that would apply to the proposed commercial-scale GFT facility. The detailed results of this study are presented in Sections 4.0 and 5.0 of this document. Major findings and conclusions pertaining to GFT project permitting feasibility are summarized below.

1. A commercial-scale GFT facility can be constructed and operated in compliance with environmental regulations and standards.

### On-Site GFT Facility

2. The GFT facility would be exempt from the need to obtain permits, licenses, or approvals if it were constructed on-site (i.e., in very close proximity to the contamination). Under this scenario, the CERCLA on-site permit exemption would apply, and numerous redundant and time-consuming administrative permitting and approval requirements could be avoided. EPA has provided guidance on streamlining on-site CERCLA actions and avoiding permitting equivalency procedures that would delay a cleanup.
3. Several technical and logistical constraints must be considered in determining whether it would be feasible to construct and operate the proposed GFT facility on-site. These include solid waste processing facility locational criteria, proximity to sediment dewatering operations, and availability of suitable property for acquisition. DNR has not yet determined whether a GFT facility could be located on-site.
4. The facility would still be required to meet the substantive applicable or relevant and appropriate requirements (ARARs) of applicable statutes and regulations. This mechanism provides for expedited implementation of the remedial design while ensuring that substantive regulatory requirements are met.

5. On-site construction and operation (exempting the GFT facility from permitting) would significantly streamline approval and public participation procedures and shorten the time required to design and build the GFT facility. It should be noted, however, that the lead agency has the authority to impose ARARs and other Federal or State policies, guidelines, or propose rules capable affecting the schedule.

#### Off-Site GFT Facility

6. Permits, approvals, or licenses (referred to as 'permits' in the remainder of this section) would be required for PCB Management, Air Quality, Solid Waste, and Wastewater. It was assumed that process wastewater would be treated and discharged to a publicly owned treatment works (POTW). In addition, storm water management permits, one for facility construction and one for operation, would be required.
7. The air construction permit, industrial wastewater pretreatment permit, storm water construction permit, and solid waste processing license would need to be applied for and obtained prior to beginning construction.
8. The 40 CFR Part 761 rules covering storage, and the detailed PCB waste incineration requirements in Part 761, only apply to wastes containing 50 ppm or greater PCBs. Because of the lengthy timeframe required to obtain final approval from EPA Region 5 for melting these wastes it may be advantageous to obtain permits from DNR to begin storing and melting sediments containing less than 50 ppm PCBs. The facility could begin melting the less than 50 ppm PCB waste while securing approvals for >50 ppm material. This type of operation would probably require that a sediment sampling and segregation protocol be developed to distinguish between sources greater or less than 50 ppm.
9. Sediment containing 50 ppm or greater PCBs could not be melted until EPA Region 5 issued a final PCB disposal permit.

10. Final EPA approval for melting sediment containing 50 ppm or greater PCBs requires that emissions do not exceed 0.001 g/kg PCB fed. Based on contacts with EPA Region 5 personnel, analytical methods quantifying only the Arochlor series in the feed material, and only the 10 PCB homolog groups in the exit gas have been approved for demonstrating compliance with the PCB emission limit.
11. The federal PCB management regulations and the Wisconsin solid waste regulations require applicants to provide a financial responsibility mechanism (i.e., surety bond, closure insurance, closure letter of credit, corporate guarantee, or other form of financial commitment specified in the regulations) to both EPA and DNR for facility closure. EPA would not require post closure care if all the closure requirements for the GFT facility have been met.
12. Based on current Minergy emission estimates, a minor source (i.e., non-Prevention of Significant Deterioration [PSD]) construction permit would be required for the GFT facility prior to beginning construction. Also, a major source (Title V) operation permit would be required because the potential NO<sub>x</sub> emission rate is greater than 100 tons per year. The operation permit application must be submitted in parallel with the construction permit application; however, the facility could begin operating before obtaining the operation permit.
13. Demonstration of compliance with NR 445 and 446 toxic air contaminant regulations would be required under both on-site and off-site GFT scenarios. For off-site permitting, the demonstration must be included in the air construction permit application. The analysis must include emissions estimates and possibly ambient impact analyses (i.e., dispersion modeling) for stack emissions related to many of the contaminants already identified in the sediments. Post operation testing may also be required.
14. Based on the assumption that the GFT facility would discharge process wastewater to a POTW, a pretreatment permit would probably be required by the POTW. The process wastewater to be discharged would need to meet a PCB discharge limit included in the

permit issued under section 307(b) or 402 of the Clean Water Act. DNR must also approve the plans and specifications for the wastewater pretreatment plant. For storm water management, notices of intent (NOIs) must be submitted for coverage under general storm water permits for construction and operation. DNR could require the facility to apply for and obtain an individual storm water permit for operation, instead of a general permit.

15. Each of the permitting requirements identified above involves public participation except for general storm water permits. Multiple public notices, comment periods, and at least one public hearing should be anticipated under the off-site construction scenario. Under the on-site scenario, redundant and time-consuming program-specific public participation procedures would be avoided, and public involvement would be streamlined.
16. In addition to the identified permitting requirements, DNR may require an environmental analysis and/or environmental impact report for one or more permits pursuant to the Wisconsin Environmental Policy Act (WEPA) [Environmental Analysis and Procedures for Department Actions - NR 150].

#### Open Items

17. Feedback received from Region 5 indicated that there was some question as to whether TWCA could be waived under an on-site CERCLA permit waiver. However, as stated in OSWER Directive 9355.7-03: "...response actions conducted by a lead agency, or by a potentially responsible party or other person under an order or consent decrees with EPA, are covered under the ambit of CERCLA section 121(e)(1). Response actions by a lead agency include those response actions implemented by EPA, the Coast Guard, or other Federal Agency. They also include response actions implemented by a State or political subdivision operating pursuant to a contract or cooperative agreement executed pursuant to CERCLA Section 104(d)(1), under which EPA selects (or must approve) the remedy."

18. The provider of dewatered sediment to a melter facility would need to determine which system they would use to certify whether or not sediment is regulated by TSCA (i.e., concentrations measured in situ or after dewatering).

Table 2-1. Summary of GFT Facility Permitting Requirements

Note: If the GFT facility is located on-site in the context of CERCLA, an exemption from permitting requirements applies.				
Regulatory Program	Agency	Permit / Approval Type	Public Participation	Description
PCB Management	DNR and EPA Region V	Operation Approvals	Yes	<ul style="list-style-type: none"> <li>Detailed approval application(s) required</li> <li>Separate approvals obtained from DNR and EPA, covering sediment storage and incineration</li> <li>Demonstration test required</li> <li>Initial Research and Development (R&amp;D) approval recommended</li> </ul>
Air Quality	DNR	Construction Permit	Yes	<ul style="list-style-type: none"> <li>Minor source construction permit procedures</li> <li>Detailed, complete permit application required</li> <li>Construction permit from DNR required prior to beginning construction</li> </ul>
	DNR and EPA (Title V)	Operation Permit	Yes	<ul style="list-style-type: none"> <li>Title V (Part 70) source permit or synthetic minor operating permit</li> <li>Detailed, complete permit application required with certification</li> <li>Permit not required prior to commence operation</li> <li>EPA review required for Title V permit</li> </ul>
Solid Waste	DNR	Plan of Operation Approval(s) and Operating License(s)	Yes	<ul style="list-style-type: none"> <li>Initial site approval</li> <li>Construction inspection may be required</li> <li>Detailed licensing application required</li> <li>DNR may agree to combine approvals under PCB regulation with solid waste approval</li> </ul>



Wastewater	Local/Municipal & DNR	Pretreatment Permit <sup>a</sup>	Yes	<ul style="list-style-type: none"> <li>▪ Pretreatment permit from POTW incorporating PSNS and sewer use ordinance required</li> <li>▪ POTW pretreatment permit must include PCB discharge limit</li> <li>▪ DNR must review and approve plans and specifications</li> </ul>
Storm Water	Department of Commerce	Construction Permit	No	<ul style="list-style-type: none"> <li>▪ Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) must be submitted prior to beginning construction</li> </ul>
	DNR	Operation Permit	No	<ul style="list-style-type: none"> <li>▪ Storm Water Pollution Prevention Plan (SWPPP) must be submitted prior to beginning construction</li> <li>▪ Notice of Intent (NOI) must be submitted prior to operation</li> </ul>

<sup>a</sup> Assumes GFT facility process wastewater will be discharged to a POTW. A second possibility is that wastewater will be discharged to the sediment dewatering facility WPDES treatment plant under agreement/contract.

### **3.0 FACILITY DESCRIPTION**

This section provides a brief description of the proposed 250 ton glass/day GFT facility and defines in general terms the air, water, and solid waste discharges expected based on preliminary design information contained in previously published documents. Commercial-scale GFT design and process rate information is summarized in Table 3-1. The information presented in this section provides the basis for defining applicable environmental requirements for the facility. It should be noted that some of the information presented in this section may change during the detailed design phase of the project. Each plant area is discussed in more detail below.

#### **3.1 Sediment Handling and Storage**

It has been assumed for this study that the GFT facility will be separate from (but possibly adjacent to) a principal dewatering site for dredged Fox River site sediment. The dewatered sediment, containing approximately 50% free moisture, will be transported from the dewatering site to the GFT facility's sediment storage building. The method of transport has not yet been chosen. During warm weather, sediment will be stockpiled in this building allowing for continuous processing during the cold winter months when dredging and dewatering operations may be idle.

Outdoor handling operations and temporary sediment piles at the GFT facility are expected to be a minor source of fugitive dust and possibly organic compound emissions. Storm water runoff from these operations may contain entrained sediment. It is assumed that the sediment storage building will have roof ventilators with negligible emissions. Some amount of leachate will likely be generated during storage of the dewatered sediment. This low volume flow would be directed to the water collection system and sent to the wastewater treatment plant along with the other water discharge.

**Table 3-1. Summary of Proposed Commercial-Scale GFT Design Parameters**

Parameter	Value	Units
Sediment Feed Rate (design)	600	Ton/day
Aggregate Production Rate (design)	250	Ton/day
Melter Temperature	2,500 – 2,900	° F
Dryer Condensate Rate	48	GPM
Scrubber Blowdown Rate	15	GPM
Cooling Tower Blowdown Rate	37	GPM
Melter Exhaust Rate	4,940	dscm/hr
Auxiliary Heater Size	< 100	mmBtu/hr input (HHV)

### 3.2 Sediment Drying

The dewatered sediment will be prepared for drying by first mixing it with dried sediment to approximately 25-30% moisture. From this point, the sediment will be conveyed to the dryers, which will reduce the moisture content to approximately 5-10%. Heat for drying will be supplied by hot oil. The hot oil will be heated by both melter exhaust gas and by an auxiliary natural gas-fired heater. Vapors from the drying process will be conveyed through a mechanical collector to remove entrained fines, and then conveyed through a venturi scrubber and packed tower arrangement. Exhaust vapor from the tower will be recycled through the dryers. The entire system will be operated under negative pressure. A small split stream from the packed tower exhaust fan will be directed to a burner on the melter.

There are no direct emission points associated with the drying operation. Only the natural gas-fired auxiliary heater, a support facility for the drying operation, will exhaust directly to the atmosphere. Emissions from the dryers (the split stream) will be combusted in the melter and emitted through the melter exhaust stack. This emission point is further discussed in Section 3.3 – Melter Operations. All sediment conveyors, storage hoppers, and silos will be of a closed design and will be ventilated continuously through a high efficiency fabric filter located within the dryer building. Collected dust will be directed back to one of the dry sediment storage silos.

The only process wastewater stream from this area will be approximately 48 GPM of water condensed from the dryer exhaust stream. No solid waste streams other than normal plant trash from routine operation and maintenance are expected from the dryer plant.

### **3.3 Melter Operation**

Dried sediment will be discharged from each dryer into a storage hopper, one for each dryer. The sediment will then be conveyed to a mixing hopper to allow for the addition of fluxing agent (ground limestone) to control the melting temperature. The mixing hopper will supply six chargers feeding dried sediment into the melter. Molten glass from the melter will discharge into a water-filled quench tank, where the material will solidify and fracture into a glass aggregate product. A set of screws will withdraw, dewater and transport the glass material to an adjacent storage pile.

The GFT melter will employ thermal energy recovery. Melter exhaust gas will be combined with a cooler exhaust gas stream that has been recirculated from the hot oil heat exchanger. The combined gas will enter the exchanger, provide heat to the hot oil, and will then flow in series through gas cleaning devices (scrubber, fabric filter, carbon adsorption system, and possibly a catalytic NO<sub>x</sub> control system). Table 3-2 presents a summary of estimated commercial-scale GFT regulated air pollutant emission rates based on data collected during pilot plant operation, as estimated by Minergy. The only other emissions expected from the melter area will be from building ventilation. The packed tower on the melter exhaust will generate a 15 GPM continuous blowdown stream.

**Table 3-2. Summary of Estimated Commercial-Scale GFT Emissions**

Pollutant	Emissions	Units
PM	1.09	Estimated potential, tons/yr
SO <sub>2</sub>	44.4	Estimated potential, tons/yr
VOC	0.07	Estimated potential, tons/yr
CO	0.18	Estimated potential, tons/yr
NO <sub>x</sub>	109.4	Estimated potential, tons/yr
Arsenic	ND	Actual from pilot test, µg/dscm
Barium	ND	Actual from pilot test, µg/dscm
Chromium	ND	Actual from pilot test, µg/dscm
Lead	ND	Actual from pilot test, µg/dscm
Mercury	1.9	µg/dscm
Mercury	0.183	Estimated potential, lb/yr
Selenium	ND	Actual from pilot test, µg/dscm
PCBs	0.0035	lb/year
PCDD/F	0.002	Actual from pilot test, ng/dscm

ND: Non detect.

### 3.4 Other Discharges

The plant cooling tower, containing non-contact cooling water, will generate a maximum of 37 GPM of continuous blowdown to control solids and other contaminants in the cooling water. The cooling tower will also be a source of PM/PM<sub>10</sub> emissions. There may be an on-site oxygen plant, but environmental discharges from oxygen production have not yet been defined. Expected sources of air, wastewater, storm water and solid wastes from the plant are listed in Table 3-3.

**Table 3-3. Listing of Expected Environmental Discharges**

Category	Plant Area	Description
Air	Grounds	Outdoor handling and storage - fugitives
	Sediment storage building	Building ventilation
	Dryer building	Sediment dryer exhaust <sup>a</sup>
		Auxiliary hot oil heater
	Melter	Melter exhaust
		Building ventilation
	Other	Cooling tower fans
Storm water	Plantwide	Outdoor handling, storage, and roadways
Wastewater	Sediment storage building	Leachate
	Dryer building	Dryer condensate
	Melter	Scrubber blowdown
	Other	Cooling tower blowdown
Solid Waste	Plantwide	Maintenance waste and plant trash

<sup>a</sup> Recycled, except for a split stream that will be combusted in the melter.

#### 4.0 REGULATORY ANALYSIS

Performed in this study was a multi-media environmental regulatory analysis for a potential commercial-scale GFT installation. Both federal and Wisconsin regulations and selected statutes that contained permitting or licensing requirements were analyzed. Where possible, applicable regulatory and permitting requirements were defined or statements of non-applicability were made with supporting basis. It should be noted that the regulatory analysis was not comprehensive. Rather, the focus was on rules and statutes that contained permitting and/or licensing requirements that may impose significant siting, timing, design, or other constraints on facility approval.

There are two GFT facility siting scenarios, on-site or off-site, that significantly impact permitting and approval requirements, public participation, and the time duration between site selection and facility operation. Each of these scenarios is discussed below.

Under the on-site scenario, the GFT facility would be constructed on the Fox River Remediation project site. In accordance with CERCLA [40 CFR 300.400(e)] no federal, State, or local permits, approvals, or licenses (referred to as 'permits' in the remainder of this section) are required for removal or remedial action conducted entirely "on-site," where such action is selected and carried out in compliance with CERCLA Section 121. The CERCLA on-site permit exemption was included in Act to avoid time-consuming and duplicative administrative requirements and therefore speed up remedial action. On-site activities remain subject to all substantive regulatory requirements, and must meet all applicable or relevant and appropriate requirements (ARARs) as defined in the ROD. Section 4.1 provides additional information on the CERCLA permit exemption for on-site remedial actions.

If the proposed GFT facility cannot be located on-site, the CERCLA permit exemption would not be available and the facility would be required to obtain all applicable permits. Permitting requirements applicable to an off-site commercial-scale GFT facility are presented in Sections 4.2 through 4.9.

#### 4.1 On-Site GFT Facility

As described in Section 1.0, DNR has been designated the lead agency for the Fox River site cleanup. Although the site was proposed for addition to the National Priority List (NPL) in 1998, a subsequent agreement between EPA and DNR resulted in the deferment or nullification of final listing. As the lead agency for the Fox River site cleanup, DNR has agreed to closely follow the CERCLA process. Several steps in this process have been substantially completed, including the Draft Remedial Investigation and Feasibility Study (RI/FS), Proposed Plan, and associated public involvement steps. A final RI/FS, a responsiveness summary, and a Record of Decision (ROD) are expected to be released within the next 6 months. DNR has indicated that the ROD will likely be issued in two stages. After the initial ROD is released, and updated or final ROD will be issued within approximately 6 months. This process will allow for the development of detailed design and cost information for selected treatment/disposal alternatives prior to final ROD publication.

CERCLA response actions are exempted by law from the requirements to obtain federal, state, or local permits related to activities conducted on-site. However, this permit exemption does not directly waive or remove any substantive provisions of permitting regulations that are applicable or relevant and appropriate requirements (ARARs). The CERCLA permit exemption is potentially available to the Minergy GFT facility, assuming the technology is selected as part of the remedy and the facility can be located on-site. For the purpose of CERCLA and the permit exemption, on-site means:

“the aerial extent of contamination and all suitable areas in the very close proximity to the contamination necessary for implementation of the response action...On-site remedial action may involve limited areas of non-contaminated land; for instance, an on-site treatment plant may need to be located above the plume or simply outside of the waste area itself.”

A site for the proposed Minergy GFT facility has not been chosen. Based on the current status of the Fox River remediation project, insufficient information is available to assess the feasibility of



locating the GFT facility on-site. Siting efforts should be coordinated with the overall Fox River remediation project to better define the on-site scenario.

## **4.2 Investigation and Remediation**

Wisconsin Administrative Code NR 700 – 754 contains rules and regulations applicable to the identification, investigation, and remediation of sites subject to regulation under s. 292.11, 292.15, 292.31 or 292.41, Stats. Elements of these rules are applicable to Fox River site cleanup; however, based on communication with DNR staff, the cleanup will follow the Superfund program process. As such, the NR 700 series rules and regulations are not being directly utilized.

## **4.3 PCB Waste Management**

This section presents a summary of federal and state PCB regulations pertaining to facility construction and operation. Federal regulations are found at 40 CFR Part 761, and are discussed in Section 4.3.1. State PCB management statutes and regulations are presented and discussed in Section 4.3.2. Coordinated approval under both sets of rules is discussed in Section 4.3.3, and demonstration test burn issues are discussed in Section 4.3.4. Section 4.3.5 presents information on recent PCB incineration approvals and demonstration tests.

### **4.3.1 Federal PCB Management Regulations**

Details of the federal regulations applicable to the proposed GFT facility are presented in Table 4-1. In general, most of the requirements are found in 40 CFR Part 761 Subpart D – Storage and Disposal. Unlike air permitting, the procedure for obtaining a PCB approval is not a pre-construction process. In fact, the facility must be constructed, undergo a shake-down period, and perform a demonstration test before the application process can be completed.

An approval application must first be prepared and submitted to the EPA Region V Administrator for both the sediment storage area and the melter. The application must include a

written closure plan and cost estimate, demonstration of financial responsibility for closure, location, detailed description (including site plans, design drawings and engineering reports), a listing of local, state and federal permits and approvals that are required, and other information. The EPA Region V PCB Coordinator has indicated that the process would include submittal of a complete application; development and submittal of a demonstration test plan; performance of the demonstration test; submittal of the results to EPA; public notice and 60-day comment period on the initial approval to operate [potentially including a public hearing]; inclusion of comments into final approval. Major required elements of the application and approval are shown in Table 4-1, and detailed requirements may be found in the Appendix.

The sediment storage building must adhere to minimum design requirements. The rules also specify minimum design, monitoring system, and pollution control system requirements for the melter as shown in Table 4-1. Decontamination requirements are applicable for equipment and personal protective equipment that comes in contact with PCBs. Subpart J of 40 CFR Part 761 contains specific monitoring, record keeping and reporting for the sediment storage and incineration operations, while Subpart K requires PCB waste disposal records and reports, including requirements for manifests.

#### **4.3.2 Wisconsin PCB Management Regulations**

Table 4-1 also shows Wisconsin PCB statutes and regulations. Wisconsin Statutes 299.45 and 289.53, and NR 157 all apply to facilities that store, incinerate and/or treat PCB wastes. Based on the analysis conducted in consultation with DNR solid waste personnel, the following Wisconsin PCB rules and would both apply to the Minergy GFT facility:

- Wisconsin Statutes 289.53 applies to a “commercial PCB waste treatment or storage facility.” DNR staff have determined that the sediment is PCB waste, and that the GFT facility is a treatment facility. As such, s. 289.53 would apply to the GFT facility;
- NR 157 is the implementing rule based on 299.45 stats., which requires DNR to adopt rules prescribing the methods and providing or designating sites and facilities for the

disposal of PCBs and products containing PCBs. The GFT facility would be used to dispose of PCB waste and, as such, must comply with the requirements of NR 157.

It should be noted that the types of permits and approvals required for the sediment dewatering facility have not yet been defined, because its configuration and location has not yet been determined. Thus, for this analysis it was assumed that the GFT facility would be located and permitted separately from the dewatering facility.

Wisconsin Statutes 289.53, which regulates commercial PCB waste storage and treatment facilities, is applicable and requires that the GFT facility comply with several other Wisconsin solid waste statutes, including obtaining an operating license, developing a site specific feasibility report and a plan of operation, and complying with financial responsibility requirements. These solid waste requirements are more fully discussed in Section 4.5. Based on discussions with DNR staff, the PCB approval and solid waste licensing can be combined into one approval process, covered by a single license issued by DNR.

Wisconsin Statutes 299.45, implemented by NR 157, requires department approval after submission of a written handling and storage plan, and complete plans and specifications for the incineration facility per the Wisconsin air pollution rules and hazardous waste regulations. NR 157 also requires installation of a scrubber to control hydrochloric acid mist, and demonstration that the incinerator will meet minimum temperature, residence time and exhaust gas excess O<sub>2</sub> recommended design requirements.

Table 4-1. Summary of PCB Management Regulatory Requirements

Regulatory Citation	Title	Summary of Requirements	Applicable? (Y/N)	Comment
<b>Federal Requirements</b>				
Subpart A	General	Applicability, PCB Concentration Assumptions For Use, Definitions, and References	Y	No specific requirements apply to the proposed facility.
Subpart B	Manufacturing, Processing, Distribution in Commerce, and use of PCBs and PCB Items	Not Applicable	N	
Subpart C	Marking of PCBs and PCB Items	Not Applicable	N	
Subpart D	Storage and Disposal	See breakdown of Subpart D sections below.	Y	
761.60	Disposal Requirements	(f)(1) Each operator of a chemical waste landfill, incinerator, or alternative to incineration approved under paragraph (e) of this section shall give the following written notices to the state and local governments within whose jurisdiction the disposal facility is located: (f)(1)(i) Notice at least thirty (30) days before a facility is first used for disposal of PCBs required by these regulations; and (f)(1)(ii) At the request of any state or local government, annual notice of the quantities and general description of PCBs disposed of during the year. This annual notice shall be given no more than thirty (30) days after the end of the year covered.	Y	Requires an initial notice of PCB disposal to the state and local government. If requested by the state or local government, requires an annual report of the PCBs disposed.
761.61	PCB Remediation Waste	(b) Performance-based disposal. (b)(2) Any person disposing of non-liquid PCB remediation waste shall do so by one of the following methods: (b)(2)(i) Dispose of it in a high temperature incinerator approved under §761.70(b), an alternate disposal method approved under §761.60(e), a chemical waste landfill approved under §761.75, or in a facility with a coordinated approval issued under §761.77. (b)(2)(ii) Decontaminate it in accordance with §761.79.	Y	In the case of the proposed GFT facility, this is the overall requirement to incinerate the sediment.
761.62	Disposal of PCB Bulk Product Waste	Not Applicable	N	The GFT facility would not be used to dispose of bulk product waste.

Regulatory Citation	Title	Summary of Requirements	Applicable? (Y/N)	Comment
761.63	PCB Household Waste Storage and Disposal.	Not Applicable	N	PCB household waste is exempt from regulation.
761.64	Disposal of Wastes Generated as a Result of Research and Development Activities Authorized Under §761.30(j) and Chemical Analysis of PCBs.	Not Applicable, unless required to perform pre-test studies on GFT prior to demonstration test.	Uncertain	It was assumed that the GFT facility would not be used to dispose of R&D and PCB chemical analysis wastes.
761.65	Storage for Disposal	<p>"Storage for Disposal" means temporary storage of PCBs that have been designated for disposal. Part 761.65 applies to storage for disposal of PCBs at concentrations of 50mg/kg or greater. This section is applicable to on-site storage of sediments at the proposed GFT facility, and there are multiple requirements that will apply:</p> <ul style="list-style-type: none"> <li>• A one-year time limit for storing received waste, with written notice to EPA needed for a time extension (resulting in automatic extension of storage time by 1 additional year) [761.65(a)];</li> <li>• Design requirements related to roof and walls, floor and cubing including minimum containment, no floor drains or expansion joints allowed, and must be located above 100-yr flood plain [761.65(b)].</li> <li>• Building must be marked as required in 761.40(a)(10) [761.65(c)(3)].</li> <li>• Items/equipment that contact PCBs must be decontaminated before being removed from storage building [761.65(c)(4)].</li> <li>• Container storage must meet 49 CFR 171 to 180 [761.65(c)(6)].</li> <li>• Must establish and maintain records per 761.180 [761.65(c)(10)].</li> <li>• Must prepare a storage facility application, and obtain approval from EPA or designated state for storing the PCB waste [761.65(d)(3) - see below].</li> </ul>		
761.65 (d)(3)	Storage Application Requirements	<p>EPA requires that an application be submitted for a new storage for disposal facility. Based on the application, written approval is granted by the EPA Administrator for Region 5. Major elements of the application include:</p> <ul style="list-style-type: none"> <li>• Identification of operator, &gt;5% stock owners, officials with direct management responsibility, compliance history of company's other facilities, facility supervisory staff and waste management staff qualifications.</li> <li>• List of all companies currently owned or operated in the past that had/have waste management responsibilities.</li> <li>• Written closure plan, including closure cost estimate and a demonstration of financial responsibility for closure as specified in 761.65(g).</li> </ul> <p>[Note: The regulations specify that separate storage for disposal and incinerator approvals (see 761.70 below) are not necessary - they can be combined into a single approval - provided that all application and approval requirements for each type of facility are met.]</p>		

Regulatory Citation	Title	Summary of Requirements	Applicable? (Y/N)	Comment
761.70	Incineration	<p>The proposed GFT melter meets the 761.3 definition of an "Incinerator" of PCBs. There are multiple requirements that apply to PCB incinerators, including:</p> <ul style="list-style-type: none"> <li>• Design requirements: combustion efficiency &gt;99.9%, measure rate and quantity of PCBs fed, continuously measure and record combustion temperature, install a water scrubber for HCl control, measure O<sub>2</sub> and CO (continuous) and CO<sub>2</sub> (periodic) of the exhaust.</li> <li>• Develop (and obtain EPA approval for) a contingency plan for failure of certain monitoring equipment.</li> <li>• Conduct a demonstration test.</li> <li>• Emissions of no more than 0.001 g PCB/kg PCB fed (i.e., 99.9999% DRE for PCBs).</li> <li>• Maintain data and records per 761.180.</li> <li>• Notify EPA at least 30 days prior to transferring ownership in property and/or transferring right to operate the incinerator.</li> <li>• Submit an application to the EPA Region 5 Administrator, and obtain written approval to operate the incinerator [761.70(d) – see below].</li> </ul>		
761.70 (d) and (d)(1)	Incinerator Application Requirements	<p>EPA requires that an application be submitted to EPA Region 5 to obtain approval to operate the melter. Based on the application, written approval to operate is granted by the EPA Administrator for Region 5. Major elements of the application include:</p> <ul style="list-style-type: none"> <li>• Location.</li> <li>• Detailed description, including general site plans, design drawings, and engineering reports.</li> <li>• Sampling and monitoring equipment and facilities available.</li> <li>• Waste volumes expected to be incinerated.</li> <li>• Local, state and federal permits or approvals.</li> <li>• Schedules and plans for complying with approval requirements of this regulation.</li> </ul>		
761.70 (d)(2)	Incinerator Trial Burn Requirements	Following receipt of the application described above, the EPA Regional Administrator will determine whether a trial burn is required and will notify the applicant of his/her decision. If a trial burn is required, the applicant must submit a detailed trial burn plan for approval. The EPA Regional Administrator will approve, require additions/modifications, or disprove the plan and request another plan.		
761.71, 761.72, 761.75	High Efficiency Boilers, Scrap Metal Recovery Ovens and Smelters, and Chemical Waste Landfills	Not Applicable	N	

Regulatory Citation	Title	Summary of Requirements	Applicable? (Y/N)	Comment
761.77	Coordinated Approval	Specifies requirements for, and conditions under which approvals for storage and incineration will be coordinated with other state and/or federal agencies. Requires that the applicant for a new facility request a coordinated approval through EPA Region 5.	Y	This is the mechanism through which the EPA and DNR jointly approve the facility under federal and state PCB management regulations.
761.79	Decontamination Standards and Procedures	Requires the decontamination of equipment and surfaces that contact liquid and non-liquid PCBs, including use of proper personal protective equipment during decontamination, confirmatory sampling and analysis, and maintenance of records for 3 years. Also requires wastewater be discharged to a treatment works.	Y	
Subpart E	Exemptions	Not Applicable	N	
Subpart F	Transboundary Shipments of PCBs For Disposal	Not Applicable	N	
Subpart G	PCB Spill Cleanup Policy	Not Applicable	N	
Subpart J	General Records and Reports	Requires specific monitoring, recordkeeping and periodic reporting for the sediment storage and incineration operations.	Y	
Subpart K	PCB Waste Disposal Records and Reports	This subpart requires the proposed facility to obtain an EPA Identification number, provide a Notification Of PCB Waste Activity (EPA Form 7710-53), complete manifests, maintain and track manifests, resolve exceptions or prepare exception reports, report to EPA unmanifested shipments, and prepare/maintain a Certificate of Disposal for each manifested shipment that is stored and/or incinerated.	Y	
<b>State Requirements</b>				
Wisconsin Statutes 299.45	Manufacture and Purchase of Polychlorinated Biphenyls	With respect to the proposed facility, this rule requires the department to adopt rules prescribing the methods and providing or designating sites and facilities for the disposal of PCBs and products containing PCBs.	Y	This regulation does not contain any prescriptive requirements that apply to the proposed facility.



Regulatory Citation	Title	Summary of Requirements	Applicable? (Y/N)	Comment
Wisconsin Statutes 289.53	Commercial PCB Waste Storage and Treatment Facilities	<p>This Statute requires the proposed facility to comply with several of the Wisconsin solid waste Statutes:</p> <ul style="list-style-type: none"> <li>Develop a site specific feasibility report per s. 289.23 - .29</li> <li>Develop a plan of operation per s. 289.30</li> <li>Comply with financial responsibility requirements in s. 289.41</li> <li>Obtain an operating license per s. 289.31</li> </ul> <p>These rules codify the rulemaking requirement of s. 299.45 above. They include:</p> <ul style="list-style-type: none"> <li>A written handling and storage plan must be reviewed, approved, denied or deemed incomplete by DNR within 65 days of receipt [157.03(1)].</li> <li>Department approval must be obtained for incineration [157.07(2)].</li> <li>Complete plans and specifications for the incineration facility must be submitted to DNR in compliance with all applicable provisions of NR 400-499 [Air Pollution Control] and NR 600-699 [Hazardous Waste] [157.07(2)(a)].</li> <li>Minimum requirements for PCB incineration: a suitable balance of operational requirements (dwell time, temperature, turbulence, and excess O<sub>2</sub>), and a scrubber to remove hydrochloric acid mist from the exhaust. The following requirements are recommended: <ul style="list-style-type: none"> <li>2 second dwell time at 2,000°F + 3% excess O<sub>2</sub> in stack; or</li> <li>1-1/2 second dwell time at 2,700°F + 2% excess O<sub>2</sub> in stack [157.07(2)(b)].</li> </ul> </li> <li>Test methods must be used, as specified in NR 157.20 Testing methods for PCBs and products containing PCBs.</li> </ul>	Y	Note: each of the solid waste requirements are further discussed in more detail in Section 4.5.
DNR Chapter NR 157	Management of PCBs and Products Containing PCBs		Y	It was assumed that Minergy would not be a transporter or full service contractor for the PCB waste. There are requirements for both of these types of entities that are not listed in this table.



### 4.3.3 Coordinated Approval

The federal rules (40 CFR Part 761.77) provide a Coordinated Approval mechanism through which EPA and DNR can jointly approve the proposed storage and incineration facilities. A request for coordinated approval must be submitted to both EPA Region 5 and DNR. The EPA Region and DNR could then each issue an approval that ensures that there are no conflicting requirements while ensuring that provisions of each regulation are addressed.

### 4.3.4 Demonstration Tests for PCB Contaminated Soils and Sediments

40 CFR Part 761.70 requires that emissions do not exceed 0.001g PCB/kg PCB fed. EPA considers this equivalent to a 99.9999% destruction/removal efficiency (DRE) for PCBs. EPA recognizes that, in completing a trial burn (demonstration test) of soils or sediments containing low levels of PCBs, it is sometimes not possible to demonstrate this level of removal without first spiking the feed material with pure PCB to substantially increase its PCB concentration. Although the 0.001g PCB/kg PCB fed requirement has been waived in the past, the EPA Region V PCB Coordinator has indicated that with coordinated approval, the waiver could not be granted. However, he also indicated that the Region could be flexible on the ways to show this level of DRE. If the concentration of PCBs in the feed material is high enough, it will be possible to demonstrate the 99.9999% DRE without spiking by analyzing for the Arochlor series in the feed material and 10 homologs in exhaust gas samples. Calculations performed by Minergy using the pilot-scale PCB test results indicate that the GFT can readily meet the 0.001g PCB/kg PCB fed emission limit without spiking the feed.

Conversations with EPA personnel and recent documents issued by EPA headquarters for a Maxymillian Technologies mobile PCB soil desorption unit indicate that an Approval to Demonstrate the Disposal of Polychlorinated Biphenyls (a 'demonstration approval') is generally issued by EPA for a short time period to perform the demonstration test. Additionally, an 'interim approval' can be granted by EPA to operate the unit under the same operating conditions as during the demonstration test. An interim approval was also issued for Maxymillian Technologies. According to the Region 5 staff, the facility could also obtain an

approval from Region V to melt <50 ppm PCB sediment material after the demonstration test but before obtaining final approval.

In addition to the 40 CFR Part 761 requirements, EPA policy also requires the following testing and limitations be met during a demonstration test:

- Measurement of the stack emissions for chlorinated dibenzodioxins and dibenzofurans;
- Particulate matter emission levels no greater than 180 mg/dscm (0.08 gr/dscf) when corrected to 7% O<sub>2</sub>; and
- Total PCB concentrations in scrubber water, fly ash (if applicable), and bottom ash (if applicable) of no greater than 2 ppm.

EPA Region V follows the draft guidelines referenced above for demonstration tests.

Appendix B of that document discusses monitoring, sampling, and analysis procedures. A copy of the EPA guidance document is contained in Appendix B of this report. In addition, in July 2001, EPA issued test burn guidance for hazardous waste combustion facilities that includes guidance on PCB incineration.

#### **4.3.5 Recent Permits and Demonstration Test Plans**

The study researched PCB incinerators that were constructed and operated in the last 10 years. The majority these sites were associated with Superfund cleanups where temporary or mobile incinerators were located on-site, and due to the CERCLA permit exemption, did not have to obtain approvals from EPA. In a few cases, existing commercial off-site incinerators were used for some of the waste. A summary of identified sites, including Superfund and other incineration and vitrification sites and sites located in EPA Region V, is presented in table format the Appendix A. A compact disk containing all CERCLA Records of Decision (RODs) current through the 3<sup>rd</sup> quarter of 2003 is available and can be requested from EPA headquarters.

A set of approvals obtained for the Maxymillian Technologies' mobile PCB soil desorption unit from EPA Headquarters are probably the most recent representative examples of the type of PCB

incineration approvals that would be issued by EPA for the commercial-scale GFT. These were nationwide PCB approvals issued by EPA OPPTS in Washington, D.C. between July 11, 1997 and September 27, 1999. They included two demonstration approvals, a letter granting interim approval, and two full approvals (initial and amended), and were based in part on applications submitted by Maxymillian in December 1995.

PCB laden sediment was incinerated in a rotary incinerator at the Crab Orchard Wildlife Refuge Superfund site in Southern Illinois in 1996-97. This installation represents the most recent example of on-site PCB soil/sediment incineration at a Superfund site in EPA Region V. A demonstration test plan and test results report were both developed and issued for that installation.

#### **4.4 Air Quality**

A complete review of air quality regulations, both federal and State of Wisconsin, was performed to assess regulatory and permitting requirements for the proposed commercial-scale GFT.

Where possible, applicability was either positively defined or negative declarations were made with supporting basis. Section 4.4.1 presents a summary of the regulatory applicability review, including a detailed table cataloguing the regulations reviewed and applicability conclusions.

Section 4.4.2 contains a more complete discussion on particular regulations, standards, or permitting requirements that constitute real and substantive constraints on the approval and operation of the proposed GFT facility.

##### **4.4.1 Regulatory Review**

Potentially applicable federal and Wisconsin (NR 400 Series) rules and regulations were reviewed to: 1) determine applicability or non-applicability to the proposed commercial-scale GFT; 2) present the basis for the applicability conclusions; and 3) for applicable and potentially applicable rules, summarize substantive requirements (e.g., emissions limitations, testing and monitoring requirements, permitting requirements, and public involvement aspects). Table 4-2 presents a complete matrix of rules and regulations reviewed, a brief summary of each regulations contents and requirements, and applicability status conclusions.

Table 4-2. Summary of Air Quality Regulatory Requirements

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
<b>Federal Requirements</b>				
<i>40 CFR 60 New Source Performance Standards (NSPS)</i>				
Subpart A (§ 1-19)	General Provisions	Contains general requirements for sources subject to specific NSPS standards. Includes definitions, determination of construction, reconstruction, or modification, notifications, recordkeeping, and performance testing requirements. Also includes general control device and reporting requirements.	Y	NSPS general provisions will be applicable to the Minergy GFT as an affected facility under Subparts Dc and UUU (see below).
Subpart Dc (§ 40c-48c)	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	Contains SO <sub>2</sub> and PM standards for steam generating units with a rated capacity between 10 and 100 MMBtu/hr commencing construction, reconstruction, or modification after June 9, 1989.	Y	The proposed dryer auxiliary heater (hot oil heater) meets the definition of "steam generating unit" in §60.41c. As such, the standard will be applicable to the heater. For natural gas only fired unit, only the general reporting and recordkeeping requirements of §60.48c are applicable. No specific emission limits, monitoring and testing requirements, or other substantive requirements are applicable.
Subpart E (§ 50-54)	Standards of Performance for Incinerators	Contains PM emissions standards for solid waste incinerators with a charge rate > 50 tons/day constructed or modified after August 17, 1971.	N	"Incinerator" is defined as "any furnace used in the process of burning solid waste ..." "Solid Waste" is defined as refuse, more than 50 % of which is municipal type waste consisting of a mixture of paper, wood, yard wastes, food wastes..." The Minergy GFT does not meet the definition of an incinerator for the purpose of this regulation.

Sediment Melter Permitting Review

Minergy Corporation

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
Subpart CC (§ 290-296)	Standards of Performance for Glass Manufacturing Plants	Contains PM emissions standards for glass melting furnaces commencing construction or modification after June 15, 1979.	N	From the definitions contained in the regulation, it appears that NSPS Subpart CC would not apply to the Minergy GFT. Although the GFT meets the broad definition of a "Glass melting furnace" in §60.291, it does not fit any of the product codes (SICs) contained in the standards. See detailed discussion in Section 4.4.2.
Subpart OOO (§ 670-676)	Standards of Performance for Nonmetallic Mineral Processing Plants	Contains PM standards applicable to affected facilities at nonmetallic mineral processing plants.	N	Nonmetallic mineral processing is defined in § 60.761 as any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in §60.670 (b) and (c). The proposed GFT facility does not meet this definition.
Subpart UUU (§ 730-737)	Standards of Performance for Calciners and Dryers in Mineral Industries	Contains PM standards for calciners and dryers at mineral processing plants that commence construction, reconstruction, or modification after April 23, 1986.	N	Affected facilities include dryers and calciners at mineral processing plants. "Mineral processing plant" is defined as "any facility that processes or produces any of the following minerals, their concentrates or any mixture of which the majority (>50 percent) is any of the following minerals or a combination of these minerals: alumina, ball clay, bentonite, diatomite, feldspar, fire clay, fuller's earth, gypsum, industrial sand, kaolin, lightweight aggregate, magnesium compounds, perlite, roofing granules, talc, titanium dioxide, and vermiculite." Based the definition of affected facility, it does not appear that this NSPS would be applicable to the GFT facility. See detailed discussion in Section 4.4.2.

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
Subpart CCCC (§ 2000-2265)	Standards of Performance for Commercial and Industrial Solid Waste Incineration (CISWI) Units	Contains emissions limits for Cd, CO, dioxins/furans, HCL, Pb, Hg, Opacity, NOx, PM, and SO <sub>2</sub> for new, nonexempt CISWI units.	N	The proposed GFT does not meet the definition of CISWI in §60.2265 because the unit will be equipped with energy recovery. Heat from the melter will be recovered and used as process heat for the sediment dryer. See detailed discussion in Section 4.4.2.
<b>40 CFR 61 National Emission Standards for Hazardous Air Pollutants (NESHAP)</b>				
Subpart A (§ 1-19)	General Provisions	Contains general requirements for sources subject to specific 40 CFR Part 61 NESHAP standards. Includes definitions, determination of construction or modification, notification of startup, reporting, compliance with standards and maintenance requirements, emission tests, and monitoring requirements.	N	Part 61 NESHAP general provisions would not be applicable to the Minergy GFT because the unit would not be subject to any specific standards of 40 CFR 61.
Subpart C (§ 30-34)	National Emission Standard for Beryllium	Contains beryllium standards for multiple source categories, including incinerators, that process beryllium-containing waste.	N	The proposed GFT and sediment feedstock do not meet the applicability criteria for this standard. "Beryllium-containing waste" is defined as "material contaminated with beryllium and/or beryllium compounds used or generated during any process or operation performed by a source subject to this subpart." "Incinerator" is defined as "any furnace used in the process of burning waste for the primary purpose of reducing the volume of the waste by removing combustible matter." Based on the draft RI/FS and Proposed Plan, the Fox River site sediment is not beryllium contaminated. Furthermore, the GFT does not meet the definition of "incinerator" contained in this regulation.
Subpart E (§ 30-34)	National Emission Standard for Mercury	Contains mercury emission standards applicable to sources that process mercury ore, use mercury chlor-alkali cells, and incinerate or dry wastewater treatment plant sludge.	N	The proposed GFT does not meet the rule applicability criteria. The facility would not incinerate or dry wastewater treatment plant sludge as defined in the rule.



Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
Subpart N (§ 160-165)	National Emission Standards for Inorganic Arsenic Emissions from Glass Manufacturing Plants	Contains arsenic emission limits and control requirements for glass melting furnaces. Applicable to glass melting furnaces using commercial arsenic as a raw material.	N	The proposed GFT would not use commercial arsenic as a raw material.
<b>40 CFR 63 National Emission Standards for Hazardous Air Pollutants (NESHAP)</b>				
Subpart A (§ 1-15)	General Provisions	Contains general requirements for sources subject to specific MACT standards. Includes definitions, construction and reconstruction, compliance with standards and maintenance requirements, performance testing and monitoring requirements, notifications, recordkeeping and reporting, and control device requirements.	N	40 CFR Part 63 NESHAP general provisions would not be applicable to the Minergy GFT facility because no specific Part 63 NESHAPs are expected to apply (see below).
Subpart B (§ 40-56)	Requirements for Control Technology Determinations for Major Sources in Accordance With Clean Air Act Sections, Sections 112(g) and 112(j)	Requires case-by-case MACT determinations for: 1) Construction or reconstruction of a major source of HAP after the effective date of section 112(g)(2)(B) and the effective date of a title V permit program in the State or local jurisdiction in which the major source would be located; 2) A source within a source category or subcategory under part 63 that is located at a major source that is subject to an approved title V permit program and for which the Administrator has failed to promulgate emission standards by the section 112(j) deadlines.	N	The proposed commercial-scale GFT would not be a major source of HAP.



Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
Subpart Q (§ 400-406)	National Emission Standards for Hazardous Air Pollutants from Industrial Process Cooling Towers	Contains requirements applicable to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals on or after September 8, 1994, and are either major sources or are integral parts of facilities that are major sources as defined in §63.401.	N	The proposed commercial-scale GFT would not be a major source of HAP.
Subpart DD (§ 680-698)	National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations	Contains equipment design and HAP standards for sources meeting both of the following criteria: 1) The plant site is a major source of hazardous air pollutant (HAP) emissions as defined in 40 CFR 63.2. 2) At the plant site is located one or more of operations that receives off-site materials as specified in paragraph 680(b) and the operations is one of the following waste management operations or recovery operations as specified in paragraphs 680(a)(2)(i) through (a)(2)(vi).	N	The proposed commercial-scale GFT would not be a major source of HAP.
Subpart RR (§ 960-966)	National Emission Standards for Individual Drain Systems	Contains requirements for the control of air emissions from individual drain systems for which another subpart of 40 CFR parts 60, 61, or 63 references the use of this subpart for such air emission control.	N	The GFT would not be subject to any Part 60, 61, or 63 standards that reference 40 CFR 63 Subpart RR.
Subpart EEE (§ 1200-1213)	National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors	Contains emission standards applicable to all hazardous waste combustors: hazardous waste incinerators, hazardous waste burning cement kilns, and hazardous waste burning lightweight aggregate kilns, except as provided in Table 1 of section 63.1200. Hazardous waste combustors are also subject to applicable requirements under 40 CFR parts 260-270 (RCRA).	N	Based on communications with DNR, The Fox River site sediment is not considered hazardous waste for the purpose of RCRA (as defined in 40 CFR 261.3 (see Section 4.6).

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
Subpart DDDDD	Industrial Boiler and Process Heater MACT (Pending)	This standard has not been proposed. The standard is expected to apply to industrial boilers, institutional/commercial boilers, and process heaters located at major sources of HAP.	N	The proposed commercial-scale GFT would not be a major source of HAP.
<b>Title V Major Source Operating Permits</b>				
40 CFR 70	State Operating Permit Programs	Specifies minimum requirements for State Title V operating permit programs. The Wisconsin Part 70 program received final interim approval from EPA in 1995 (see 60 FR 12128, 3/6/95). The State Title V operating permit regulations are contained in NR 407.	Y	See discussion under Wisconsin Requirements - NR 407.
<b>Compliance Assurance Monitoring (CAM)</b>				
40 CFR 64		Requires development and implementation of CAM plans for controlled sources with uncontrolled PTE > 100 tpy or 10/25 for HAP. Exclusion applies where basis for limit is a standard proposed after 11/15/90 pursuant to section 111 or 112 of the CAA (i.e., NSPS or NESHAP).	Uncertain	Only NO <sub>x</sub> emissions are expected to exceed the uncontrolled CAM applicability thresholds of 100 and 10/25 tpy. Currently, no NO <sub>x</sub> controls are planned for the GFT. If NO <sub>x</sub> controls are installed on the GFT exhaust to meet a non-excluded regulatory requirement (e.g., NAAQS), CAM would be applicable to the unit.
<b>Risk Management Plans (RMP)</b>				
40 CFR 68	Chemical Accident Prevention Provisions	Establishes list of regulated toxic and flammable substances and threshold storage quantities pursuant to 112(r) of the CAA. Requires development of Risk Management Plan for listed chemicals stored above threshold quantities.	N	It is not expected that regulated chemicals would be stored in quantities exceeding 112(r) thresholds. Non-applicability should be confirmed based on the detailed facility design.
<b>Wisconsin Requirements (NR400 – Air Pollution Control)</b>				
NR 400	Air Pollution Control Definitions	Contains NR 400 series regulation definitions	Y	
NR 401	Nonattainment Areas	Establishes procedures and criteria to identify a nonattainment area and to reclassify a nonattainment area as an attainment area.	N	Generally applicable but not specifically applicable to the GFT project.

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 403	Local Air Pollution Control Program	Establishes criteria for departmental approval of local air pollution control programs.	N	Generally applicable but not specifically applicable to the GFT project.
NR 404	Ambient Air Quality	Establishes geographic air regions, air standards and ambient air increments (for attainment areas statewide).	Y	The proposed GFT would most likely be located in Sub-region I of the Lake Michigan Intrastate Air Quality Control Region. More stringent emission limitations than those in the Administrative Code may or may not be needed to meet ambient air quality standards in ch. NR 404, Wis. Adm. Code. This would be determined during the permit review process.
NR 405	Prevention of Significant Deterioration (PSD)	Provisions apply to new major stationary sources and all major modifications to major sources located in areas designated as attainment or unclassified.	N	The proposed GFT would not constitute a "major stationary source" for the purpose of PSD. The GFT process is not a listed source category under NR405.02 (a)(1) and potential emissions of PSD regulated air pollutants are each expected to be well below the 250 ton per year major source threshold applicable for attainment and unclassified areas. See Table 3-2 for estimated potential emissions.
NR 406	Construction Permits	Requires that a source obtain a construction permit before commencing construction, reconstruction, replacement, relocation or modification of a stationary source unless the source is exempt. Also establishes permit review requirements and permit duration for construction permits.	Y	The proposed commercial-scale GFT facility does not meet any of the specific source category exemptions in NR 406.04(1) nor the general source category exemption in NR 406.04(2). As such, a minor source (i.e., non-PSD) construction permit would be required. The department shall make a determination on a permit application within 145 days of receiving a complete application. See detailed discussion in Section 4.4.2.

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Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 407	Operation Permits	Contains operation permit requirements for specific sources and size categories (part 70 and non-part 70), exemption provisions, and permit application submittal schedules. Also sets forth procedures for revising, suspending, and revoking operation permits.	Y	The proposed commercial-scale GFT facility does not meet any of the source exemptions in NR 407.03. As such, an operation permit and permit application would be required in accordance with NR 407.04. The GFT would be subject to Part 70 source operation permit requirements as defined in NR 407.02(6) if potential emissions exceed major source thresholds (i.e., 100 tpy for criteria pollutants and 10/25 tpy for HAP). Based on current estimates, potential NO <sub>x</sub> emissions from the commercial-scale GFT exceed 100 tpy. See detailed discussion in Section 4.4.2.
NR 408	Construction Permits for Direct Major Sources in Nonattainment Areas	Establishes requirements for reviewing and issuing construction permits for new major sources and major modifications to major sources located in ozone transport regions or nonattainment areas.	N	Based on the attainment designations in 40 CFR 81 for Wisconsin, the potential GFT location counties are attainment, unclassifiable, or better than national standards for all criteria pollutants. For the purpose of this analysis, potential County locations are: Winnebago, Outagamie, and Brown County.
NR 409	Acid Rain Portion of Operation Permits	Implements the acid rain program under Title IV of the CAA (40 CFR Part 72). Generally applies to utility generating units.	N	The proposed GFT is not an affected unit under the acid rain program.
NR 410	Air Permit, Emission and Inspection Fees	Establishes requirements and procedures for the payment of application fees and emission fees for sources required to obtain construction or operation permits.	Y	Permit application fees and annual emission fees would apply to the GFT. See detailed discussion in Section 4.4.2.
NR 411	Construction and Operation Permits for Indirect Sources	Establishes requirements for construction and operation permits for indirect sources for the control of CO emissions (i.e., emissions from mobile sources).	N	The proposed GFT is a direct source.

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NR 415	Control of Particulate Emissions	Establishes PM emission source categories and emission limitations.	Y	PM emission limits for processes, fuel burning equipment, incinerators, and fugitive dust are potentially applicable to the proposed GFT source. See detailed discussion in Section 4.4.2.
NR 417	Control of Sulfur Emissions	Establishes SO <sub>2</sub> and sulfur compound emission source categories and emission limitations.	Y	Only the general limitation in NR 417.03 would apply to the GFT source. The general limitation states that no person may emit sulfur or sulfur compounds which substantially contribute to the exceeding of and air standard or cause air pollution.
NR 418	Sulfur Emission Control in Specific Geographic Areas	Establishes SO <sub>2</sub> and sulfur compound emission source categories and emission limitations for specific geographic areas to protect air quality.	N	Pursuant to NR 418.05, RACT sulfur limitations apply to specific sources categories within the corporate boundaries of Green Bay and DePere. It is not expected the GFT would be located within these boundaries, and the GFT does not fit any of the listed source categories subject to RACT.
NR 419	Control of Organic Compound Emissions	Establishes organic compound emission source categories and emission limitations.	Y	The following subsections of NR 419 would apply or potentially apply to the proposed GFT source: 1) General limitations - NR 419.03 2) Disposal of VOC wastes - NR 419.04 3) Remediation of contaminated soil or water - NR 419.07 Note: NR 419.07 does not seem to apply to dedicated environmental media remediation units/sources, but no direct exclusion was identified in the rule.
NR 420	Control of Organic Compound Emissions from Petroleum and Gasoline Sources	Establishes organic compound emission source categories and emission limitations for petroleum and gasoline sources.	Uncertain	Potentially applicable if site would include gasoline storage racks and dispensing operations

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 421	Control of Organic Compound Emissions from Chemical, Coatings, and Rubber Products Manufacturing	Establishes organic compound emission source categories and emission limitations for chemical, coatings, and rubber products manufacturing sources.	N	
NR 422	Control of Organic Compound Emissions from Surface Coating, Printing, and Asphalt Surfacing Operations	Establishes organic compound emission source categories and emission limitations for surface coating, printing, and asphalt surfacing operations.	N	
NR 423	Control of Organic Compound Emissions from Solvent Cleaning Operations	Establishes organic compound emission source categories and emission limitations for solvent cleaning operations.	N	
NR 424	Control of Organic Compound Emissions from Process Lines	Establishes organic compound emission source categories and emission limitations for process lines.	Uncertain	The GFT facility meets the definition of a "process line." However, current PTE emission estimates indicate that the GFT would be exempt per NR 424.03(4): Process lines from which VOC emissions are never greater than 15 lbs/day.
NR 425	Compliance Schedules, Delays, Exceptions, and Internal Offsets for Organic Compound Emission Sources in Chs. NR 419 to 424	Establishes time schedules for sources governed by VOC rules to meet emission limits and an internal offset system.	Y	For new sources, limitations apply upon startup.
NR 426	Control of Carbon Monoxide Emissions	Establishes CO emission limitations.	Y	General limitation would be applicable. CO emissions shall not substantially contribute to exceeding an air standard or cause air pollution.
NR 427	Control of Lead Emissions	Establishes lead emission limitations.	Y	General limitation under NR 427.025 and potentially specific permit condition(s) pursuant to NR 427.03 would be applicable.
NR 428	Control of Nitrogen Compound Emissions	Establishes nitrogen compound emission source categories and emission limitations	Y	General limitation under NR 428.03 would be applicable. Specific source limitations applicable only in listed counties outside of the GFT site envelope (i.e., RACT).



Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 429	Malodorous Emissions and Open Burning	Establishes emission limitations, odor tests, and abatement or control requirements for malodorous air contaminants and conditions under which open burning is permitted.	Y	General standards for objectionable odors and open burning would be applicable.
NR 431	Control of Visible Emissions	Establishes visible emission source categories and limitations	Y	General 20% opacity standard would be applicable to the GFT and associated process units/emission points
NR 436	Emission Prohibition, Exceptions, Delayed Compliance Orders and Variances	Specifies that emissions in excess of limitations set forth in NR 400 – 499 are prohibited and establishes conditions under which the Department may grant exceptions, variances, and delayed compliance orders.	Y	
NR 438	Air Contaminant Emission Inventory Reporting Requirements	Establishes requirements for submission of emission inventory reports	Y	Expected emissions from a commercial-scale GFT exceed the thresholds in Table 1. Therefore, an annual emission inventory report would be required.
NR 439	Reporting, Recordkeeping, Testing, Inspection, and Determination of Compliance Requirements.	Establishes general reporting, recordkeeping, testing, inspection, and determination of compliance requirements for sources.	Y	
NR 440	Standards of Performance for New Stationary Sources	Incorporates federal NSPS requirements to enable Department implementation and enforcement.	Y	See Federal Requirements, NSPS. Applicable standards: ▪ NR 440.207 (Subpart Dc) ▪ NR 440.73 (Subpart UUU)
NR 445	Control of Hazardous Pollutants	Establishes emission limitations and control requirements for hazardous pollutants. Requirements do not apply to specific pollutants regulated under NR 446 – 449 or to sources subject to NESHAP under CAA Section 112 (for the specific pollutants regulated).	Y	The emission limits for new or modified sources in NR 445.04 would be applicable to the GFT. Tables 1 – 5 specify de minimis emission rates for hazardous compounds. Property boundary ambient air concentrations based on TLV and applicable exemptions are contained in NR 445.04. See detailed discussion in Section 4.4.2.

Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 446	Control of Mercury Emissions	Establishes emission limitations, stack sampling procedures and emission monitoring requirements for mercury emissions	Y	The general limitation under NR 446.03(1) would be applicable to the GFT (ambient concentration < 1 µg/m <sup>3</sup> , 30-day avg.) The GFT does not meet the definition of sludge incineration or sludge drying plant. "Sludge" is defined as sludge produced by a treatment plant that processes municipal or industrial wastewater.
NR 447	Control of Asbestos Emissions	Establishes emission limitations for asbestos air contaminant sources, procedures to be followed when working with asbestos, and reporting and recordkeeping requirements.	N	It was assumed that no asbestos or asbestos containing materials would be used in the GFT facility.
NR 448	Control of Beryllium Emissions	Establishes emission limitations and stack sampling and testing procedures for beryllium emissions	N	It was concluded that the Fox River site sediments are not defined as "beryllium containing waste."
NR 449	Control of Vinyl Chloride Emissions	Establishes emission limitations and stack sampling and testing procedures for vinyl chloride emissions and reporting and recordkeeping. Applicable only to plants that produce ethylene dichloride, vinyl chloride or other polymers containing vinyl chloride.	N	
NR 460	Emission Standards for Hazardous Air Pollutants for Source Categories - General Provisions	Establishes standard enabling the Department to implement and enforce CAA section 112 standard general provisions.	N	No specific standards under 40 CFR Parts 61 or 63 are expected to apply to the GFT facility. See NESHAP regulations under "Federal Requirements."
NR 463	Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks	State rule implementing NESHAP requirements	N	
NR 464	National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry	State rule implementing NESHAP requirements	N	



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Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 465	National Emission Standards for Hazardous Air Pollutants for Wood Furniture Manufacturing Operations	State rule implementing NESHAP requirements	N	
NR 466	National Emission Standards for Hazardous Air Pollutants for the Printing and Publishing Industry	State rule implementing NESHAP requirements	N	
NR 468	National Emission Standards for Hazardous Air Pollutants for Miscellaneous Processes	State rule implementing NESHAP requirements for: perchloroethylene dry cleaning, petroleum solvent dry cleaning, sterilization facilities and industrial process cooling towers	N	
NR 469	National Emission Standards for Hazardous Air Pollutants for Halogenated Solvent Cleaning Operations	State rule implementing NESHAP requirements	N	It was assumed that none of the covered operations would occur at the GFT facility.
NR 484	Incorporation by Reference	Incorporates by reference certain federal testing, monitoring and other technical standards	Y	Generally applicable to all sources subject to NR 400 – 499.
NR 485	Control of Emissions from Motor Vehicles, Internal Combustion Engines and Mobile Sources; Tampering Prohibition	Establishes emission limitations for motor vehicles, internal combustion engines, and mobile air contaminant sources and prohibits tampering with motor vehicle air pollution control equipment	Y	Motor vehicle standards indirectly applicable. IC engine standard for PM (0.5 lb/MMBtu) potentially applicable to emergency power generation equipment.
NR 486	Employee Commute Options Program	Applicable only in severe ozone nonattainment area.	N	
NR 487	Clean Fuel Fleet Program	Establishes clean fuel fleet program pursuant to 40 CFR Part 88. Applicable to centrally fueled vehicle fleets in counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha.	N	
NR 488	Refrigerant Recovery from Salvaged or Dismantled Refrigeration Equipment	Establishes requirements for the recovery of ozone depleting refrigerants from salvaged or dismantled equipment	N	

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Regulatory Citation	Title	Summary of Content/Requirement(s)	Applicable? (Y/N)	Comment
NR 489	Conformity of General Federal Actions to State Implementation Plans	Sets forth policy, criteria, and procedures for demonstrating and assuring conformity of general federal actions to the applicable state implementation plan. Applicable to: 1) Federal actions related to transportation plans, programs, and projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601 et seq.) and 2) Federal actions where direct and indirect emissions in a nonattainment or maintenance area would equal or exceed any of the rates in 40 CFR 51.853 (b)(1) or (2).	N	
NR 490	Procedures for Uncontested Case Public Hearings	Establishes the content for a public hearing request and procedures for hearing requests and comment submittal/processing.	Y	Generally applicable.
NR 492	Department Review Times	Establishes a time schedule for department actions on permits or approvals not otherwise specified by law. This rule only includes time schedules for alternate fuel variances (10 days), temporary excess emissions plans (65 days), and use of emergency or reserve equipment (65 days).	Y	Generally applicable.
NR 493	Air Pollution Episode Levels and Episode Emission Control Action Programs	Establishes emergency episode level criteria and programs and procedures for abatement.	Y	Generally applicable.
NR 494	Enforcement and Penalties for Violation of Air Pollution Control Provisions	Provides enforcement procedures and penalties for violations of any provisions in NR 400 - 499 or a permit or plan approval.	Y	Generally applicable.
NR 499	Training and Certification Requirements for Solid Waste Treatment Facility Operators	Establishes by rule a program for the training and certification of solid waste treatment facility operators.	Y	Training and certification requirements for GFT facility operators would be applicable.